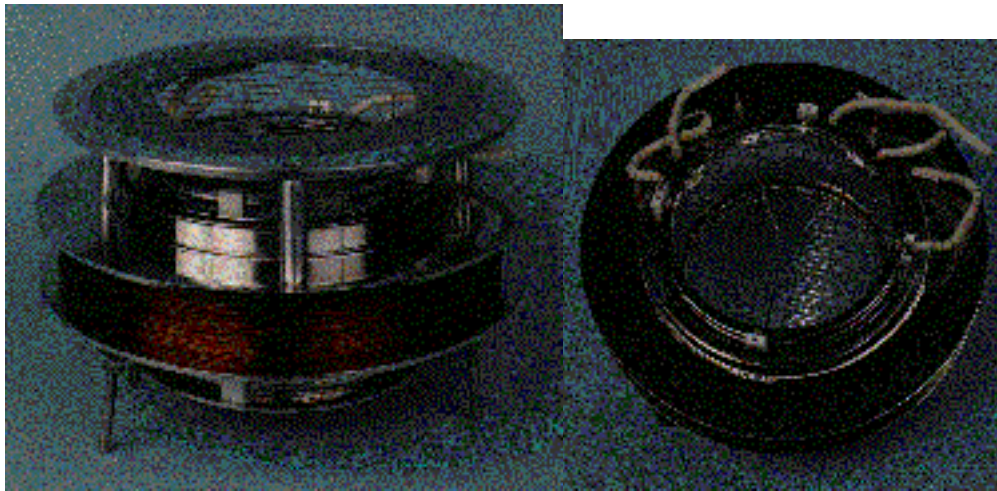


Flow-through ion gun cleans surfaces and deposits thin films

The flow through ion gun is a new type of tool that can clean surfaces or deposit thin films of many different kinds of elements and chemical compounds onto both conducting and insulating surfaces. By cleaning surfaces just before deposition, the gun can produce thin films with superior adhesion. This "unidirectional" gun forms an electron driven plasma in the center and then allows material to be evaporated through this plasma. As the ionized plasma and deposit material leave the chamber, they pass by a hot filament that provides electrons to make a neutral beam. Thus both conducting and insulating materials can be deposited on both conducting and insulating substrates.



We used this process recently to produce a platinum coating inside an aluminum cylinder for a pulsed power liner target. Since aluminum forms an oxide that makes film adhesion difficult with noble metals, the flow-through gun pre-cleaned the inside surface and subsequently deposited gold followed by platinum.

This gun can deposit thin films up to ten times faster than normal ion beam deposition methods, and the thin films produced with this gun are up to ten times smoother than those produced by straight evaporation methods. This gun can also produce thin films with highly oriented crystalline structures, which is an important property in equation of state experiments.

This technology has uses in the automotive, aerospace, and aircraft industries, where coating machine tools and jet engine parts with the superior thin films will improve their longevity and performance. The gun also has applications for various cleaning and coating processes in the semiconductor industry and for decorative coatings and coatings on jewelry -- without producing chemical wastes that require treatment, as is presently the case in the electroplating industry.

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